

nent magnets, as shown in Sheet 1. These coils and magnets serve no other purpose and do not act in or form any part of the long telegraphic circuit in which the electric current travels when the marks are making by the current. K is a steel-spring carried by the pendulum, the extreme end rubbing gently upon the surface formed by the insulated wires in the frame B B. L is a spring fixed to the wood frame. The free end of this spring presses upon the metal frame B B. M is a slight spring carried by the pendulum, having a pin projecting through the pendulum that presses gently upon the wood frame N. U and V are two metal studs flush with the frame N. W is a permanent magnet. E is a voltaic battery. T T are sections of the earth. S S is carbon. R R R are conducting-wires. C C is a piece of clock mechanism, to which the metal frames B B act as weights. O P are two pins in the slide-spindle P². X is a coil of insulated wire suspended by two insulated springs at Y, to which are attached conducting-wires. W' is a second permanent magnet. Z is a spring.

When a communication is to be made I proceed in the following manner: I first set up the types composing the communication in the usual manner in a metal frame, which fits into metallic contact with the back of the frame B B, Fig. 2, Sheet 2, with the printing-surface in contact with the back ends of the small parallel wires. In the distant frame B B, Fig. 1, Sheet 2, will be kept placed two thicknesses of damp paper previously saturated with a solution composed of equal parts of prussiate of potassa and nitrate of soda, and at the back of the paper a smooth metal plate, pressing the paper into contact with the ends of the parallel wires and exactly fitting the frame B B. The operator, having set up his types and placed them in the frame B B, Fig. 2, Sheet 2, then joins the connecting-wire at X², and when the pendulums are at the extreme ends of their vibrations—that is, when the pins in the springs M M come upon the studs U U or V V—a current is sent through the coils X, which are then repelled by the permanent magnets W', and, pressing upon the slide-spindles, releases one pin of the top wheel, which allows the wheels to make one-eighth of a revolution. When the pins carried by the springs M M are off the studs U U or V V the current is broken, and the coils being no longer repelled by the magnets, the springs Z Z force the spindles

toward the permanent magnets, which releases another pin of the wheels, and by these repeated actions the frames B B continue falling until they reach the bottom of the frames A A.

It will be observed that the electric current constantly passes through the portion of the small insulated wires contained in the frames B B that may be in contact with the springs K K, except when the pendulums are at the extreme ends of their vibrations, and the springs K in contact with the frames B B, and as the spring K in Sheet 2, Fig. 2, will only take the current from the short wires whose inner points are in contact with some portion of the type, the current will pass at that point and no other, and consequently the current will be delivered at a corresponding point through the paper in the frame B B of Fig. 1, Sheet 2, and this operation will produce a copy of the printing-surfaces of the type in a series of small dots in the paper by the electric current decomposing the substance and changing the color of the moist chemical compound in the paper.

For simplicity in the representation and references, only one conducting-wire and one spring K are shown in the drawings, Sheet 2, as used with each instrument; but in practice these may be varied and used so as to copy an entire line of types at each vibration of the pendulums.

It is also evident that a copy of any other surface composed of conducting and non-conducting materials can be transmitted and taken by these means.

What I claim, and desire to secure by Letters Patent, is—

1. The copying of surfaces by the electric current through a single circuit of conductors by means substantially the same as herein set forth.

2. The exclusive right to the use of prussiate of potassa as the most useful ingredient in solutions of chemical compounds for preparing paper to receive marks formed by the action of electric currents thereon for telegraphic purposes.

In witness whereof I have hereunto signed my name, in the city of Washington, this 18th day of November, in the year one thousand eight hundred and forty-eight.

ALEXANDER BAIN.

Witnesses:

B. K. MORSELL,
W. SERRELL.